

REMARKS

This is in response to the Office Action dated February 6, 2008.

REQUEST FOR INITIALED PTO-1449

Before addressing the rejections raised in the Office Action, it is respectfully noted that the undersigned has not received an initialed copy of form PTO-1449 submitted with the Information Disclosure Statement filed December 17, 2007. An initialed copy of the above-identified PTO-1449 form is respectfully requested.

The Office Action reports that 1-13 and 24-31 were rejected as being anticipated by Meyers et al. "Alignment of Shared Forests for Bilingual Corpora". The Office Action also reports that claims 14-23 and 32-41 would be allowable if rewritten in independent form. While Applicants respectfully thank the Examiner, for the indication of allowable subject matter, it is believed the amended independent claims are allowable for the reasons discussed below.

Currently claims 1 and 24 are independent claims. Each of these claims have been amended to clarify the patentable references therein. Referring first to claim 1, this claim has been amended to include the feature previously recited in dependent claim 3. In particular, the step of associating has been amended to recite "associating nodes of the dependency structures to form tentative correspondences on the tangible medium, wherein associating includes forming tentative correspondences comprising translations of morphological bases and derivations." (Emphasis added). The Office Action reports that this feature was found in Meyers et al. in Section 3. Section 3 has been reviewed as is provided below for convenience.

3 Data Structures

Regularized parses are similar to the F-structure of Lexical Functional Grammar (LFG), except that a dependency type structure is assumed.⁴ Here a relation *Role(PRED, ARG)* is represented by an arc, the *PRED* of LFG at the tail of the arc, and the *ARG* (or the role recipient) at the head of the arc. For example, *el tenis* is the subject of the predicate *ser* in Figure 1. In a regularized parse, certain closed syntactic classes, such as prepositions and subordinate conjunctions, are represented as arc labels denoting roles, (e.g., the preposition *de* in Figure 1) rather than as nodes in F-structure.

Structure sharing among the trees in the parse forest allows us to reduce the number of computed scores. We compute the score for a given pair of subtrees only once, regardless of the number of trees which share these subtrees because the score of a pair of nodes depends only on the scores of their descendants (and not of their ancestors). Currently our parser records structure sharing only between NPs. Experiments in which all common structure is shared, as in Figure 1, suggest that extending structure sharing to other types of nodes would further improve performance. This structure sharing approach is based on previous work in optimizing Feature Structure-based parsing. (See for example, (Karttunen, 1985) and (Pereira, 1985)).

It is respectfully submitted that nowhere in this section is forming tentative correspondences comprising translations of morphological bases and derivations, as recited by claim 1, discussed, suggested or rendered obvious. Accordingly, applicants respectfully request withdrawal of the rejection and allowance of claim 1.

Claim 24 has also been amended to clarify the invention recited therein from Meyers et al. As amended, claim 24 now recites “aligning nodes of the dependency structures with correspondences on the tangible medium as a function of a set of rules comprising at least three different rules, wherein the dependency structures comprise a set of unaligned nodes and wherein after each of the rules are applied any aligned nodes are removed from the set of unaligned nodes before applying another rule.” (Emphasis added)

Meyers et al. teach disclose an algorithm in section 4.2 that involves computing scores that are indicative of how well two nodes correspond to each other. The score uses equation 2 in that section. The scores are stored in a matrix in order to keep track of all the permutations between comparing all the nodes in a source language with all the nodes in the target language. Presumably, based on the scores the algorithm finds the best matches between the nodes.

Applicants respectfully submit that claim 24, as amended, is patentably distinguishable from Meyers et al. because claim 24 recites that the set of rules comprise at least three rules, and that during aligning, any nodes are identified and removed from the set of unaligned nodes before another rule is applied. Applicants submit that Meyers does not maintain a set of unaligned nodes from which the set is reduced as nodes are aligned. At best, Meyers et al. discuss that some scores are set to zero when a direct translation is found as described in Section 6, but this does not involve removing nodes from a set. Even if a

conclusion was reached that the description at Section 6 of Meyers et al. pertaining to setting scores to zero is a rule that removes from nodes from a set, there are no other portions of the description that can be construed to find two more such rules. As discussed above, Meyers et al. use a calculated scores to determine relevance of nodes, and moreover, those that have the highest score are presumably alignable. Nevertheless, the scores are kept for all comparisons and nodes are not removed from consideration as each rule (from a set of three or more) is applied, as recited by claim 24. The Office Action has cited the Greedy Heuristic of Section 5 as a rule; however, this technique only speeds up the calculation of computing $S(v,v')$ as stated right before the “Procedure Greedy_{LCA}:” is provided, it does not remove aligned nodes as rules are applied.

With this Amendment, applicants have also added independent claim 55. Claim 55 is similar to claim 24, but recites that step of aligning comprises “aligning nodes of the dependency structures with correspondences on the tangible medium as a function of a set of rules comprising at least two different rules where aligned nodes are determined based on the parent/child structure.” The Office Action has referred to Figure 2 and the Greedy Heuristic as disclosing rules involving parent/child structure. Applicants respectfully disagree. Figure 2 is an illustration showing what is meant when lca-preserving alignment is not maintained. However, the algorithm disclosed by Meyers et al. requires that lac-preserving alignment be maintained. As stated by Meyers et al. in the last paragraph of Section 3 “The algorithm assumes that least common assignment ancestors are preserved in the alignment.” (Emphasis added). This comports with the requirement also provided in Section 3, which states:

If nodes $a \in V$ and $b \in V$ map into nodes
 $a' = f(a) \in V'$ and $b' = f(b) \in V'$,
 then $f(lca(a, b)) = lca(f(a), f(b)) =$
 $lca(a', b')$

With this Amendment, applicants have also added claim 56, which depends from claim 55 and recites similar language as found in claim 24. For the reasons, discussed above with respect to claim 24 and/or in combination with the features recited in claim 55, it is respectfully believed claim 56 is also allowable.

In addition, each of the dependent claims (2, 4-23, 25-41 and newly added 57-68) recite further features that when combined with the features recited in their corresponding independent claim, and any intervening claim, yield yet further, separately patentable inventions.

The foregoing remarks are intended to assist the Office in examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered exhaustive of the facets of the invention which are rendered patentable, being only examples of certain advantageous features and differences, which applicant's attorney chooses to mention at this time. For the foregoing reasons, applicant reserves the right to submit additional evidence showing the distinction between applicant's invention to be unobvious in view of the prior art.

Furthermore, in commenting on the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the same and the present invention have been

mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims.

An extension of time for consideration of this response is hereby requested. An online charge authorization for the extension of time fee is provided.

In view of the foregoing, Applicants respectfully request reconsideration of the application as amended. Withdrawal of the rejections and allowance of the pending claims is solicited.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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